WHAT IS CLAIMED IS:

1. A method of obtaining a measure of flow from an electromagnetic flow meter, comprising:

applying a shaped excitation waveform to a coil of an electromagnetic flow meter;

receiving and sampling an output signal from the meter in response to the application of the shaped excitation waveform; and

resolving sampled output data from the meter into a non-flow waveform component and a flow waveform component so as to derive a measure of flow.

2. A method according to Claim 1, wherein the shaped excitation waveform comprises a pulsed waveform.

3. A method according to Claim 1, wherein the shaped excitation waveform includes a first pulse rise section of a first polarity.

4. A method according to Claim 1, wherein the shaped excitation waveform includes a substantially constant section of a first polarity.

5. A method according to Claim 1, wherein the shaped excitation waveform includes a pulse decay section.

6. A method according to Claim 3, wherein the shaped excitation waveform includes a second pulse rise section.

7. A method according to Claim 3, wherein the shaped excitation waveform includes a second substantially constant section.

8. A method according to Claim 3, wherein the shaped excitation waveform includes a second pulse decay section.

9. A method according to Claim 6, wherein the second pulse rise, substantially constant, and pulse decay sections are of the opposite polarity to the first pulse rise section, substantially constant, and pulse decay sections.

10. A method according to Claim 1, wherein the shaped excitation waveform comprises at least one substantially constant section.

11. A method according to Claim 10, wherein the constant section of the shaped excitation waveform is used to determine background interference.

12. A method according to Claim 11, wherein the background interference is subtracted from the sampled output data.

13. A method according to Claim 1, wherein the shaped excitation waveform comprises a plurality of pulse rise sections, substantially constant sections, and pulse decay sections.

14. A method according to Claim 13, wherein alternate substantially constant sections are of alternate opposing polarities.

15. A method according to Claim 1, wherein the shaped excitation waveform is a substantially square wave waveform.

16. A method according to Claim 15, wherein alternate pulses of the square wave are of opposing polarities.

17. A method according to Claim 1, wherein resolving comprises performing a weighted least squares fit between the sampled output data and a model of the expected waveform.

18. A method according to Claim 1, wherein the non-flow waveform component is represented in the form $z.Vz(t)$.

19. A method according to Claim 18, wherein $Vz(t)$ is based on the differential of the current input to produce the excitation waveform (dI/dt).

20. A method according to Claim 18, wherein $Vz(t)$ is based on a zero signal captured empirically.

21. A method according to Claim 20, wherein $Vz(t)$ is based on an average of a plurality of captured zero signals.

22. A method according to Claim 18, wherein z is a scalar multiplier term, and wherein resolving includes determining the value of z.

23. A method according to Claim 1, wherein the flow waveform component is represented in the form $f.Vf(t)$.

24. A method according to Claim 23, wherein $Vf(t)$ is determined empirically.

25. A method according to Claim 24, wherein $Vf(t)$ is determined empirically and is based on an average of a plurality of captured flow signals.

26. A method according to Claim 23, wherein $Vf(t)$ is modelled by a mathematical function.

27. A method according to Claim 23, wherein f is a scalar multiplier term, and wherein resolving comprises determining the value of the scalar multiplier term f.

28. A method according to Claim 1, further comprising determining a measure of a trend within the sampled output data.

29. A method according to Claim 28, wherein the measure of a trend is subtracted from the sampled output data.

30. A method according to Claim 1, wherein correlating is performed over a window that does not contain an integer number of periods of all frequency components.

31. A method according to Claim 30, wherein the window is shorter than the period of the lowest frequency component.

32. A method of determining a measure of a non-flow signal from an electromagnetic flow meter comprising:

applying a shaped excitation waveform to an electromagnetic flow meter;

receiving an output from the meter in response to application of the shaped excitation waveform;

resolving sampled output data from the meter into a non-flow waveform component and a flow waveform component; and

determining a measure of the non-flow waveform component based at least in part on the resolved sampled output data.

33. A method according to Claim 32, further comprising determining a calibration measurement for the meter based on the measure of the non-flow component.

34. A method according to Claim 33, further comprising applying a correction to flow measurements determined by the flow meter based on the calibration measurement determined.

35. A method according to Claim 32, further comprising detecting a fault condition for the meter based on the measure of the non-flow component.

36. A method according to Claim 32, wherein the shaped excitation waveform is a pulsed waveform.

37. A method according to Claim 32, wherein the non-flow waveform component is represented in the form *z. Vz(t)*, and wherein *Vz(t)* is a function of the current input to form the excitation waveform and *z* is a scalar multiplier term.

38. A method according to Claim 32, wherein the flow waveform component is represented in the form *f. Vf(t)*, wherein *Vf(t)* is a function of the flow rate of a fluid through the flow meter, and wherein *f* is a scalar multiplier term.

39. An apparatus for obtaining a measure of flow from an electromagnetic flow meter comprising:

means for applying a shaped excitation waveform to the coil of an electromagnetic flow meter;

means for receiving an output from the meter; and

means for processing the output from the meter to resolve sampled output data from the meter into a non-flow waveform component and a flow waveform component so as to derive a measure of flow.

40. An apparatus for determining a measure of a non-flow signal from an electromagnetic flow meter comprising:

means for applying a shaped excitation waveform to an electromagnetic flow meter;

means for receiving an output from the meter;

means for resolving sampled output data from the meter into a non-flow waveform component and a flow waveform component; and

means for determining a measure of the non-flow waveform component.

41. A computer readable medium including a program for executing a method of obtaining a measure of flow from an electromagnetic flow meter, comprising:

applying a shaped excitation waveform to an electromagnetic flow meter;

receiving an output from the meter; and

resolving sampled output data from the meter into a non-flow waveform component and a flow waveform component to derive a measure of flow.